

REMARKS

In view of the above amendments and following remarks, Applicants respectfully request reconsideration and allowance of the above-identified application.

Claims 1-16 remain pending in this application. Claims 1-11 have been withdrawn from consideration. Of the remaining claims, Claim 12 is independent. By this Amendment, Applicants have amended Claim 12.

Claims 12, 15 and 16 stand rejected under 35 U.S.C. § 103 as being unpatentable over U.S. Patent No. 3,598,493 (Fisher) in view of U.S. Patent No. 4,780,610 (Abe). Claims 13 and 14 stand rejected under 35 U.S.C. § 103 as being unpatentable over Fisher and Abe in view of U.S. Patent No. 6,055,111 (Nomura, et al.). Applicants traverse these rejections.

As recited in independent Claim 12, Applicants' invention is directed to an optical scale having a reflecting portion, wherein a shaft holding portion of the optical scale (which holds a shaft for rotating the optical scale) and the reflecting portion are integrally molded in one piece by using one kind of transparent resin material. Also, the shaft holding portion and the reflecting portion are molded by molding portions arranged on a single surface side of the mold. Further, the reflecting portion is constructed so as to reflect an incident light ray by internal total reflection.

With this configuration, the center of the shaft holding portion and center of the reflecting pattern of the reflecting portion can be made to precisely coincide with each other. Therefore, errors in detection of a rotating angle of the optical scale can be reduced.

The Fisher patent is directed to a transparent material having internal reflection properties. The Office Action cites this patent for its description of reflecting portion 143 and shaft holding portion 150, as shown in Figure 9 of the patent.

As Applicants understand the disclosure of the Fisher patent, the reflecting portion and shaft holding portion are coaxial, but are not molded in one piece using one kind of resin material. Further, although the patent does not specifically describe the sides of the mold on which the reflecting portion and shaft holding portion are molded, it appears from Figure 9 that the reflecting portion and shaft holding portion are molded by molding portions arranged on opposite sides of the mold, respectively.

The Abe patent is cited in the Office Action as describing the molding of a reflecting portion and shaft holding portion using a resin material. However, Applicants submit that this patent does not describe a reflecting portion constructed so as to reflect an incident light ray by internal total reflection. In addition, Applicants submit that this patent describes that the reflecting portion is formed by a metal material which is different from a material forming the shaft holding portion. Consequently, the reflecting portion and the shaft holding portion are not molded in one piece using one kind of resin material.

The Nomura, et al. patent is merely cited in the Office Action as describing the use of a gate for injecting the resin material during molding. Applicants submit that this document fails to remedy the deficiencies noted above with respect to the Fisher and Abe patents.

Accordingly, Applicants submit that the Fisher, Abe and Nomura, et al. patents, taken alone or in combination, fail to disclose or suggest at least the features of a shaft holding portion and a reflecting portion being integrally molded in one piece by using one kind

of transparent resin material, with the reflecting portion being constructed so as to reflect an incident light ray by an internal total reflection, as recited in independent Claim 12.

For the foregoing reasons, Applicants request withdrawal of the rejections under 35 U.S.C. § 103.

The remaining claims in this application are dependent claims which depend from the independent claims discussed above, and are thus patentable over the documents of record for reasons noted above with respect to those independent claims. In addition, each recites features of the invention still further distinguishing it from the applied patents.

Applicants request favorable and independent consideration thereof.

This Amendment After Final Rejection is an earnest attempt to advance prosecution and is believed to clearly place this application in condition for allowance. At the very least, Applicants believe that the Amendment reduces the number of issues for appeal. This Amendment was not earlier presented because Applicants earnestly believed that the prior Amendment placed the subject application in condition for allowance. Accordingly, Applicants respectfully request entry of this Amendment under 37 C.F.R. § 1.116.

Applicants' undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should continue to be directed to our address listed below.

Respectfully submitted,

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